

Artificial intelligence in intelligent tutoring systems toward sustainable education: a systematic review

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Abstract

Sustainable education is a crucial aspect of creating a sustainable future, yet it faces several key challenges, including inadequate infrastructure, limited resources, and a lack of awareness and engagement. Artificial intelligence (AI) has the potential to address these challenges and enhance sustainable education by improving access to quality education, creating personalized learning experiences, and supporting data-driven decision-making. One outcome of using AI and Information Technology (IT) systems in sustainable education is the ability to provide students with personalized learning experiences that cater to their unique learning styles and preferences. Additionally, AI systems can provide teachers with data-driven insights into student performance, emotions, and engagement levels, enabling them to tailor their teaching methods and approaches or provide assistance or intervention accordingly. However, the use of AI and IT systems in sustainable education also presents challenges, including issues related to privacy and data security, as well as potential biases in algorithms and machine learning models. Moreover, the deployment of these systems requires significant investments in technology and infrastructure, which can be a challenge for educators. In this review paper, we will provide different perspectives from educators and information technology solution architects to connect education and AI technology. The discussion areas include sustainable education concepts and challenges, technology coverage and outcomes, as well as future research directions. By addressing these challenges and pursuing further research, we can unlock the full potential of these technologies and support a more equitable and sustainable education system.